



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) Publication number: **0 524 551 A1**

(12) **EUROPEAN PATENT APPLICATION**

(21) Application number: 92112195.0

(51) Int. Cl.⁵: **B65D 81/20**

(22) Date of filing: 17.07.92

(30) Priority: 19.07.91 IT MI910662 U

(43) Date of publication of application:
27.01.93 Bulletin 93/04

(84) Designated Contracting States:
DE ES FR GB

(71) Applicant: WHIRLPOOL EUROPE B.V.
Luchthavenweg 34
NL-5507 SK Veldhoven(NL)

(72) Inventor: Geremi, Franco, c/o Whirlpool Italia
s.r.l.
Viale G. Borghi 27
I-21025 Comerio (VA)(IT)

(74) Representative: Melio, Jan Dirk
Whirlpool Italia S.r.l., Viale Guido Borghi 27
I-21025 Comerio (VA)(IT)

(54) Sealing valve device particularly for vacuum containers.

(57) The valve device, used for maintaining and breaking the vacuum in compartments or other containers, is provided with a valve body (1) comprising a first annular projection (5) surrounding the end part (6) of the sealing member (2) and directed towards the compartment, a cylindrical portion (8) for guiding the sealing member (2), a second annular projection (9) acting as a sealing seat (10), a third annular

projection (11) for protecting the sealing member (2) and provided with a shaped region (13) which facilitates the opening of the valve device and hence the breaking of the vacuum, the sealing member (2) being in one piece and elastically deformable and being provided with an appendix (6) for retaining said sealing member (2) in situ in the valve body (1) by snap-engagement.

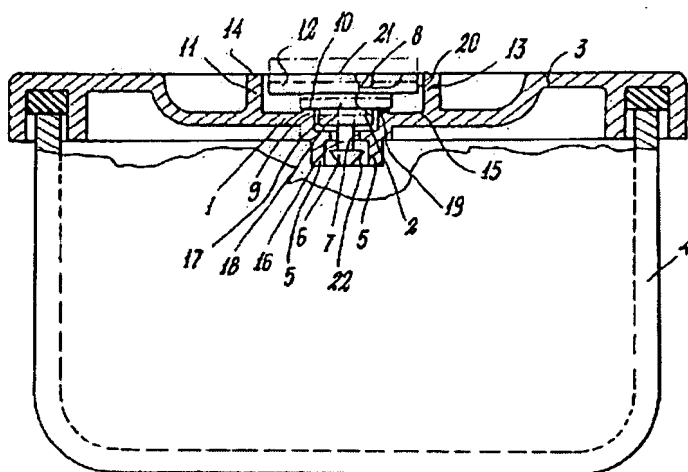


Fig. 1

EP 0 524 551 A1

This invention relates to a valve device of the type comprising a valve body with a sealing seat and a sealing or valving member for maintaining and breaking the vacuum in a compartment or container.

The invention is applicable in the most varied commercial sectors involving vacuum preservation, in particular for preserving foods in combination with other traditional preservation methods such as refrigeration.

Valve devices for maintaining and breaking the vacuum in containers, compartments and the like, such as bags, are known in the state of the art.

These known devices however suffer from drawbacks strictly related to their design.

In this respect, such devices generally comprise several components, of which the most important are a threaded element in which the sealing seat is formed, and a sealing or valving member retained in the sealing seat by a third component which is screwed onto the first element after the vacuum has been formed in the container provided with said device. This third component has to be unscrewed to break the vacuum in order to open the container.

It is therefore apparent to the expert of the art that such devices are of complicated and costly construction. In addition, it is difficult to incorporate such a device in a closure element such as a lid. Finally, such a valve device is uncomfortable for the user during its opening and closure.

An object of the present invention is to provide a valve device for maintaining and breaking vacuum which is simple to construct, comprises only a few components and is easy to use by the user.

A further important object of the invention is to provide a valve device of the stated type which can be easily associated with containers of the afore-said type or incorporated in the closure part of the container, for example its lid, and is reliable in maintaining the vacuum with the passage of time.

A further object of the present invention is to provide a valve device which is of low production cost.

These and further objects which will be apparent to the expert of the art are attained by a valve device of the stated type, characterised by comprising a valve body with a first annular projection surrounding the end sealing part and facing the compartment, and on the opposite side a tubular guide portion for said sealing member, a second projection forming the sealing seat for the sealing member, and a third annular projection for protecting the sealing member when the vacuum has been formed, and shaped to facilitate the opening of the valve device, and further characterised in that the sealing member is in one piece, is elastically deformable and comprises a projecting ap-

pendix on the vacuum side for retaining said sealing member in situ within the valve body by snap-engagement

The present invention will be more apparent from the accompanying drawings, which are provided by way of non-limiting example and in which:

Figure 1 is an axial section through the valve device provided on the lid of a container for the vacuum preservation of food;

Figure 2 is a side view of the sealing member;

Figure 3 is a section on the line 3-3 of Figure 2;

Figure 4 is a perspective overall view of the valve device with parts removed.

In the drawings, the reference numeral 1 indicates the valve body, which forms an integral part of a container 4 used for example for the vacuum preservation of food. On the inside of the lid and forming part of the valve body there is a cylindrical recess 22 for protecting the conical end 6 of a sealing or valving member 2.

A through hole 7 connects the container 4 to the outside; on the outside of the lid the valve body comprises a cylindrical guide seat 8 for the sealing member 2, a cylindrical projection 9 acting as a sealing seat for cooperating with the sealing member, and a tubular appendix 11 for protecting the sealing member when the container 4 is under vacuum.

The cylindrical recess 22 is delimited by a continuous wall 5 projecting towards the interior of the container 4.

The outer face of the cylindrical projection 9 forms the contact and sealing seat 10 between the sealing member 2 and the valve body 1.

The tubular appendix 11 of the valve body 1 is provided with at least one region 13 sunken below its upper circular face 14, to form a lead-in for the finger used by the user to open the valve device and hence break the vacuum in the container.

The sealing member 2 is advantageously in one piece and is elastic. It is mounted with its conical end 6 facing the inside of the container 4, this end having its maximum diameter exceeding that of the through hole 7 and retaining the sealing member 2 in the valve body 1 after the snap-engagement. The sealing member also comprises a stem 16, a cylindrical portion 17 which cooperates with the guide seat 8 of the valve body 1 to guide this latter, a cylindrical portion 18 the annular face of which defines the sealing surface 19 which cooperates with the face 10 of the valve body 1, and an upper cylindrical portion 12 having a greater cross-section than the preceding parts, and on which the user acts to break the vacuum.

The device of the invention is operated in the following manner.

The head of a known vacuum-producing apparatus is mounted over the tubular appendix 11; it

can be seen that when vacuum is formed in the container 4 the sealing member 2, by the effect of the negative pressure difference created between the outside and the inside of the container by means of the vacuum pump, not shown, associated with said head, comes into contact with the valve body 1 via the surfaces 10 and 19, it being correctly guided by virtue of the cylindrical portion 17 of the sealing member 2 sliding within the guide seat 8 of the valve body 1.

If the user wishes to extract something from the container 4 under vacuum, he must firstly break the vacuum. To achieve this he presses against the lateral surface 20 of the cylindrical portion 12 of the sealing member 2 in a direction transverse to the vertical axis of the valve device, via the sunken region 13 of the external tubular element 11 of the valve body 1.

In this manner the lid 3 of the container 4 is released and can be removed, while the sealing member 2 remains retained on the valve body 1 by means of the appendix 6.

If the user wishes to clean the valve body 1 or sealing member 2, he separates the two parts by simply pressing the appendix 6 so that it passes through the through hole 7, with the consequent separation of the sealing member 2 from the valve body 1.

To again insert the sealing member 2 into the valve body 1 he forcibly inserts the appendix 6 into the hole 7 by pressing axially on the outer surface 21 of the cylindrical portion 12.

A valve device according to the invention represents a reliable means which can be easily constructed, including directly on a container lid, and is more advantageous in terms of its use by the user.

Claims

1. A valve device of the type comprising a valve body with a sealing seat and a sealing or valving member for maintaining and breaking the vacuum in compartments or other containers for vacuum preservation, in particular of foods, and advantageously usable in combination with other traditional preservation methods such as refrigeration, characterised in that the valve body (1) is provided with a first annular projection (5) surrounding the end part of the sealing member (2) and extending towards the compartment, and on the opposite side a tubular guide portion (8) for said sealing member (2), a second projection (9) forming the sealing seat (10) for the sealing member (2), and a third annular projection (11) for protecting the sealing member (2) when the vacuum has been formed, and shaped (at 13) to facilitate

the opening of the valve device, and further characterised in that the sealing member is in one piece, is elastically deformable and is arranged to cooperate with a central passage through said valve body (1).

2. A device as claimed in claim 1, characterised in that the one-piece elastically deformable sealing member (2) is provided with an appendix (6) for retaining it in situ within the valve body by snap-engagement.
3. A device as claimed in claim 1, characterised in that the valve body (1) is an integral part of a closure element (3), such as a lid.
4. A device as claimed in claims 1 and 2, characterised in that the sealing member (2) is provided with a cylindrical part (17) arranged to cooperate with the guide portion (8) of the valve body (1) to achieve correct closure and sealing engagement.
5. A device as claimed in the preceding claims, characterised in that the end (6) of the sealing member (2) is of frusto-conical shape or is faceted.

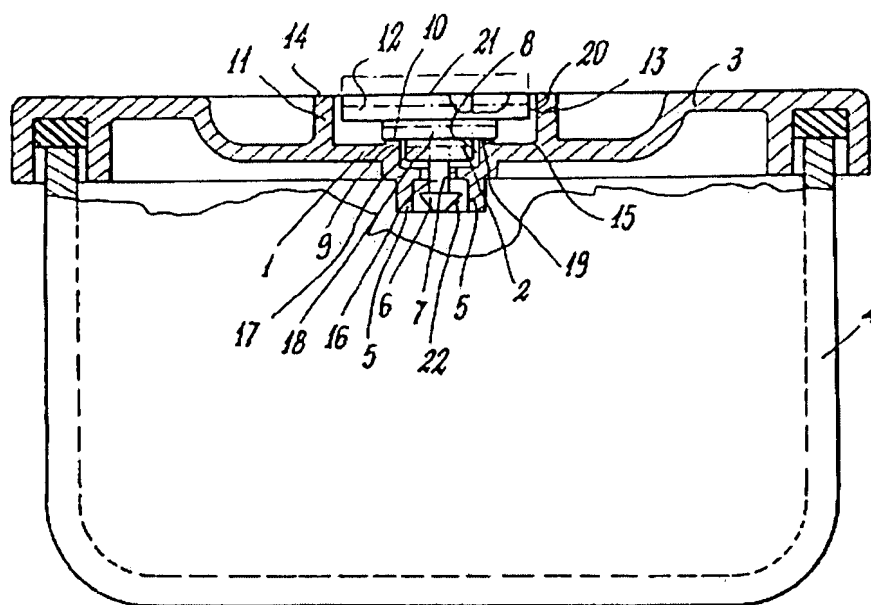


Fig. 1

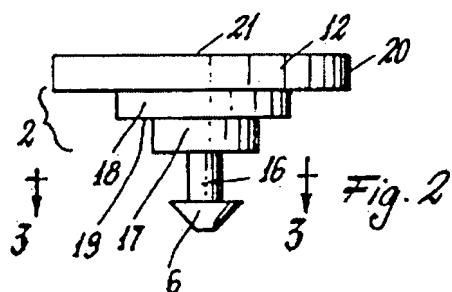


Fig. 2

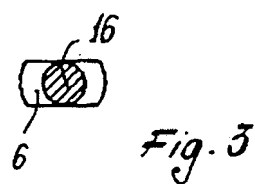


Fig. 3

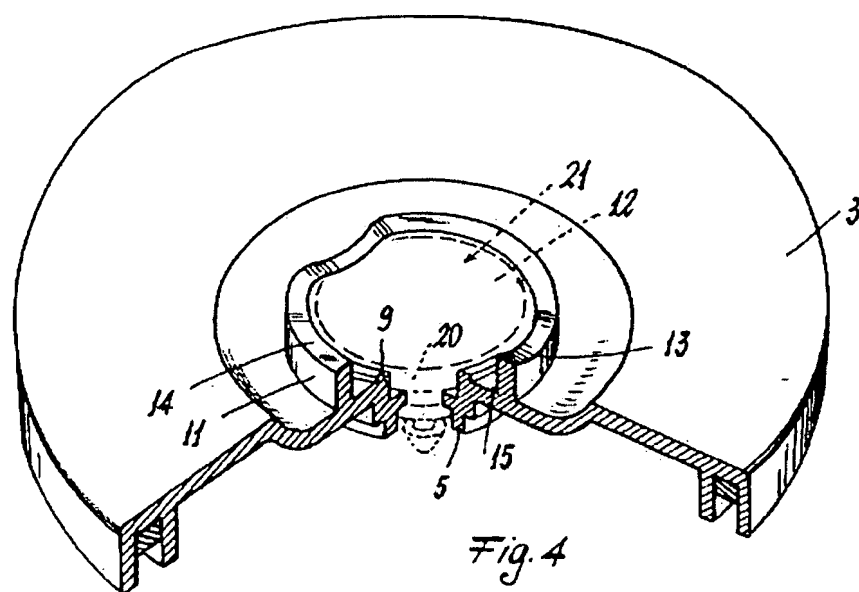


Fig. 4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 11 2195

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	US-A-4 249 583 (LUNDBLADH) * the whole document *	1-3,5	B65D81/20
A	US-A-4 984 611 (TAKATSUKI ET AL) * the whole document *	1-3,5	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B65D B658
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 29 OCTOBER 1992	Examiner LEONG, C. Y.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 150 (03.92) (P0401)